



# Markets for Clean Air: Cap and Trade Simulation

## What is it?

EPA's Markets for Cleaner Air Cap and Trade Simulation is a free tool that can help you explore how cap-and-trade programs work. Participants, working alone or in groups, control a power company and must develop a compliance strategy to comply with a cap and trade program for either SO<sub>2</sub> or CO<sub>2</sub>. Participants may install control technologies, invest in alternative energy sources, buy or sell allowances, and many other options.

## How is it used?

The simulation is a computer-based exercise that allows a group of participants to quickly put the theories of cap-and-trade programs into practice. Participants can learn about cap-and-trade in an engaging hands-on manner using a simulation that is based on real-world data and EPA's more than 20 years of experience with cap-and-trade programs. As facilitator, you can use the simulation as a stand-alone tool or as part of a larger course or seminar that deals with cap-and-trade policies.

The participants use the software to manage their power company and implement compliance strategies to meet the overall emission cap. They can adjust their strategy as necessary to take advantage of new information and market conditions. The facilitator can customize some game play options and settings to accommodate course or workshop needs.

## Features


- Easy-to-use graphical interface.
- Beginner and Advanced versions allow for a wide range of audiences.
- Detailed documentation clearly explains how to use the simulations for participants and facilitators.
- Different power companies have access to different resources (coal, wind, sun) requiring participants to come up with different strategies that will work for their specific company profile.
- Advanced version includes simulated events such as the opening of a new factory or a temporary increase in steel prices that can impact long-term compliance strategies as well as immediate compliance decisions.
- Companion Registry Application allows the facilitator to track trades and participant scores.

## How to get more information

The tool has been used successfully by university professors, conference organizers, and government environment departments to educate people about the basics of cap and trade. If you are interested in learning more, please contact







Jeremy Schreifels  
schreifels.jeremy@epa.gov  
(1) 202-343-9127

Colleen Mason  
mason.colleen@epa.gov  
(1) 202-343-9641



### Markets for Cleaner Air Cap & Trade Simulation


[About...](#) Version 1.01



SNAPSHOT UNITS TRANSACTIONS EFFICIENCIES OFFSETS

ID	Type	Fuel	Size (MW)	Cost (\$/GWh)	Generation (GWh)	Rate tons/GWh	Total (tons)	Control
1	PC	Coal	600	\$110,076	3,292	156	714,032	Pulverized Coal CCS with
2	PC	Coal	600	\$59,295	4,100	1,090	4,471,047	(None)
3	PC	Coal	350	\$61,322	2,391	1,080	2,581,250	(None)
4	NGCC	Gas	400	\$51,713	2,921	404	1,178,856	(None)
5	Wind	Wind	200	\$73,074	620	0	0	(None)

#### Unit #1 - Pulverized Coal (PC)



Year constructed: 1993

Fuel: Coal

Size: 600 MW

Max. generation: 3,292 GWh

Actual generation: 3,292 GWh

Total cost/GWh: \$110,076

CO2 emissions rate: 156 tons/GWh

Total CO2 emissions: 714,032 tons

Control Details

Pulverized coal is a conventional coal technology. Coal is ground to a fine dust and burned in boiler where the heat converts water to steam which turns a generator. Coal is a relatively inexpensive fuel, but it has relatively high emissions of pollutants, including CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, particulates, and mercury. Construction costs for pulverized coal plants (per MW capacity) are lower than IGCC technology. However, pulverized coal has lower efficiency than an IGCC.

#### Blue River Valley Electric

##### Compliance status - Year 2013

Total CO<sub>2</sub> emissions: 8,945,185 tons

Allowances: 10,849,916 tons

Offsets (8 % limit): 0 tons

Surplus allowances: 1,904,731 tons

Surplus offsets: 0 tons

Assessment: **In compliance**

##### Performance status - Year 2013

Electricity demand: 13,324 GWh

Electricity generation: 13,324 GWh

Assessment: **Demand met**

- Compliance costs: \$0

Profit ratio: **18.9 %**

##### Events

2013

Ecoland establishes CO2 emission caps